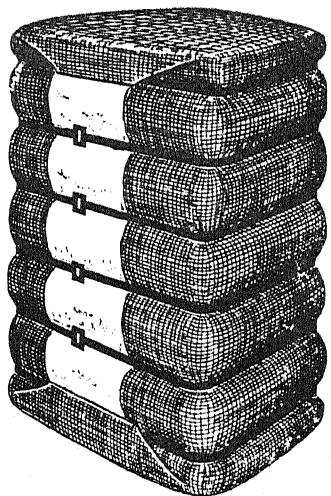




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# COTTON GIN OPERATING COSTS IN WEST TEXAS 1969-70



U. S. DEPARTMENT OF AGRICULTURE

Economic Research Service

## ABSTRACT

This report, the fourth in a series, analyzes gin operating costs in West Texas for the 1969-70 season. The gin sample from which these data were obtained was stratified, by rated hourly capacities, into four size groups. Cost comparisons by size groups are made, for this and last season, using several different costing methods. Average costs for two size groups are compared with cost estimates for synthesized model gins of comparable sizes. A 5-year comparison of average costs for all groups combined is shown.

Key Words: Cotton gins, capacity utilization rates, ginning volumes, sample gin costs, standardized costs, out-of-pocket costs, model gins, cost comparisons

## PREFACE

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Cotton Gin Operating Costs in West Texas--1968-69, Econ. Res. Serv., U.S. Dept. Agr., MRR-903, September 1970.

Copies of gin cost records are mailed in annually for analysis and for use in preparing these reports.

Washington, D.C. 20250

August 1971

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For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402

## COTTON GIN OPERATING COSTS IN WEST TEXAS--1969-70

by

Dale L. Shaw and Charles A. Wilmot  
Agricultural Economists  
Marketing Economics Division

### INTRODUCTION

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#### Sample

The gin sample is stratified into four groups, based on rated hourly capacities. These are: group 1 -- 8 bales or less; group 2 -- 9 to 11 bales; group 3 -- 12 to 20 bales; and group 4 -- 21 bales or more. Size and content of the gin sample vary slightly from year to year mainly because of periodic plant modifications which frequently alter capacity. This necessitates an annual review and reclassification of some plants into other size groups and the filling of voids thus created. During the 1969-70 season, the 42 plants in the sample ginned a total of 209,456 bales or 15.8 percent of the total ginnings for the West Texas area.

#### Objectives

Objectives of this study are to (1) determine the current costs of ginning on the High Plains of West Texas and observe trends over the past 5 years, (2) analyze the effects of changes in ginning volumes on ginning costs, (3) consider the possibilities of reducing operating costs through more efficient ginning, and (4) compare sample gin operating costs with model ginning costs.

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FINDINGS

Comparison of 1968-69 and 1969-70 Crop Years

Volumes ginned.--Average volumes in the West Texas sample gins were down this season (1969-70), compared with last (1968-69), resulting in lower rates of

gin plant capacity utilization 1/ and higher operating costs, except in group 4. Compared with last season, volumes in 1969-70 ranged from 25 percent lower for group 2 plants to 17 percent higher for plants in group 4 (table 1).

The range in volumes ginned was considerably narrower in 1969-70 than in 1968-69, indicating a more uniform volume distribution among the sample gins. The lowest sample gin volume of 1,123 bales this season was nearly double the 625 bales recorded by one sample gin last year. Also, the highest volume for a sample gin this year totaling 13,991 bales, was about 20 percent less than the high of 17,356 bales last season. This narrower range in volumes ginned is also reflected in a reduced range of capacity utilization.

Table 1.--Rated hourly capacities, volumes ginned, and capacity utilization, by ranges and averages, sample gin plants, West Texas, 1968-69 and 1969-70 seasons

Gin size group by season	Rated hourly capacity 1/		Annual volume ginned		Rate of capacity utilization 2/	
	Range	Average	Range	Average	Range	Average
	:					
<u>Bales</u>						
<u>Percent</u>						
<u>1968-69</u>						
Group 1.....:	7 - 8	7.6	625- 5,828	3,616	10 - 101	62
Group 2.....:	9 - 11	9.1	1,691- 4,853	3,056	24 - 70	44
Group 3.....:	12 - 20	15.8	1,546-13,393	6,038	14 - 87	50
Group 4.....:	21 - 67	32.9	847-17,356	7,775	5 - 81	31
Combined...:	7 - 67	15.7	625-17,356	5,066	5 - 101	42
<u>1969-70</u>						
Group 1.....:	7 - 8	7.6	1,135- 5,193	3,107	18 - 84	53
Group 2.....:	9 - 11	9.1	1,123- 4,188	2,294	16 - 60	33
Group 3.....:	12 - 20	16.2	1,595-11,613	5,179	12 - 86	42
Group 4.....:	21 - 60	32.4	3,464-13,991	9,123	14 - 77	37
Combined...:	7 - 60	16.5	1,123-13,991	4,987	12 - 84	39

1/ Manufacturers' hourly rating of gin stand complex. Variations in group average between seasons are due to sample gin plant modifications which altered rated capacity and size group classifications.

2/ Ratio of volume ginned to estimated total seasonal ginning capacity without seed cotton storage. Based on typical ginning season of 906 operating hours and a sustained seasonal ginning rate capability set at 85 percent of manufacturers' ratings.

1/ Ratio of volume ginned to estimated total seasonal ginning capacity without seed cotton storage. Based on typical ginning season of 906 operating hours and a sustained seasonal ginning rate capability set at 85 percent of manufacturers' ratings.

Costs per bale, actual percentage of capacity utilization.--Total sample gin costs 2/ per bale were up in 1969-70 for all size groups except group 4 (tables 2 and 3). The exception in group 4 shows vividly the effect of volume on cost. For all four groups combined, the average was \$26.89 per bale, an increase of \$2.52 over last season. 3/

Standardized sample gin cost 4/ averages ranged from \$30.28 for group 4 to \$35.99 for group 2, with an average cost of \$31.62 per bale for all groups combined. Last year, this cost range was \$26.26 to \$31.30 per bale for groups 1 and 4, respectively, with an all groups combined average of \$28.73 per bale.

Out-of-pocket costs ranged from \$18.98 per bale for group 4 to \$25.23 per bale for group 2. The average for all four groups combined was \$21.66 per bale. Compared with last season, average out-of-pocket costs in 1969-70 were higher in all size groups, ranging from increases of \$0.23 per bale for group 4 (despite an increase in volume ginned) to \$4.82 per bale for group 2. The overall average was \$2.30 per bale higher.

For all groups combined, individual items making up the out-of-pocket costs were all higher in 1969-70 than in 1968-69, except for energy. The greatest increase was for repairs, followed by management and miscellaneous. Increases in these three items amounted to \$0.69, \$0.56, and \$0.41 per bale, respectively.

Cost per bale, 70-percent capacity utilization.--In every case, group average cost totals in 1969-70, adjusted to a uniform rate of 70-percent capacity utilization, 5/ were substantially lower than their unadjusted counterparts (tables 2, 3, and 4). Consistently lower costs at higher rates of capacity utilization point up the beneficial effects of increased volumes on unit operating costs. Compared with last year, however, these adjusted costs were higher in all size categories. Higher per bale costs in 1969-70 reflect, in part, the inflation in prices paid for ginning inputs.

#### Five-Year Trends

Over the past 5 years, per bale operating costs in the sample gins have risen as much as 49 percent (table 5). Based on the averages for all four size groups combined, increases in per bale operating costs at actual rates of capacity utilization, were as follows: total sample gin costs--42 percent (\$18.98 to \$26.89 per bale); total standardized sample gin costs--49 percent (\$21.17 to \$31.62 per bale); and out-of-pocket costs--45 percent (\$14.94 to \$21.66 per bale). When adjusted to a uniform rate of 70-percent capacity utilization, 6/ to eliminate the effects of variations in volume, these cost rate increases were reduced to about 18, 20, and 28 percent, respectively. The increase in out-of-pocket costs at 70-percent capacity utilization may be the most meaningful of the three

2/ Taken from gin records and subjected to uniform allocation procedures as outlined in appendix.

3/ See weighting procedure in appendix.

4/ See costing methods in appendix.

5/ See adjustment procedure in appendix.

6/ Rate selection was arbitrary.

Table 2.--Sample gin costs per bale, by ranges and averages, groups 1 - 4 and all groups combined, 1/ West Texas, 1968-69 season

Cost items 2/	Group 1		Group 2		Group 3		Group 4		All groups combined	
	Range	Average	Range	Average	Range	Average	Range	Average	Range	Average
Dollars										
Management.....	1.68-11.63	3.62	2.65- 6.12	3.76	1.39- 5.25	2.65	1.06-12.13	2.42	1.06-12.13	2.92
Insurance.....	.11- 1.46	.29	.20- .60	.29	.11- .70	.32	.14- 1.65	.32	.11- 1.65	.31
Taxes.....	.11- 1.09	.35	.14- .89	.39	.12- .86	.34	.12- 1.42	.42	.11- 1.42	.38
Energy.....	1.52- 4.10	1.97	.89- 3.43	1.76	.86- 3.32	2.17	1.07- 6.75	2.18	.86- 6.75	2.08
Labor.....	3.52-11.00	5.30	3.63- 6.07	5.05	4.48- 9.61	5.41	3.81- 7.55	4.48	3.52-11.00	5.03
Bagging and ties...	2.27- 3.51	2.68	2.37- 3.06	2.63	2.40- 2.85	2.72	2.64- 2.91	2.71	2.27- 3.51	2.70
Repairs.....	1.13- 7.33	3.82	1.04- 6.64	3.99	2.10- 5.68	3.44	2.23- 9.75	4.04	1.04- 9.75	3.79
Miscellaneous.....	.99- 3.62	1.75	.91- 4.59	2.54	.85- 4.04	2.17	1.29- 5.64	2.18	.85- 5.64	2.15
Out-of-pocket subtotal 3/.....	15.33-32.22	19.78	17.48-24.11	20.41	14.88-26.47	19.22	14.29-47.80	18.75	14.29-47.80	19.36
Depreciation.....	1.11- 7.46	3.00	1.01- 5.70	2.76	1.70-16.17	4.32	1.06-40.83	6.01	1.01-40.83	4.40
Interest.....	0 - 2.80	.97	0 - 3.83	.55	0 - 3.08	.73	0 - 8.15	.32	0 - 8.15	.61
Total.....	17.07-35.31	23.75	19.16-30.12	23.72	17.99-42.35	24.27	15.35-96.78	25.08	15.35-96.78	24.37
Standardized depreciation 4/.....	2.77-11.83	4.63	2.45-11.09	5.74	2.41-16.88	6.11	2.11-57.08	9.13	2.11-57.08	6.77
Standardized interest 4/.....	1.13- 5.49	1.85	1.11- 4.44	2.33	1.01- 6.52	2.33	.84-21.63	3.42	.84-21.63	2.60
Total standardized 5/.....	20.18-49.54	26.26	21.52-35.04	28.48	21.20-47.81	27.66	17.24-126.51	31.30	17.24-126.51	28.73

1/ Group 1 -- 8 bales or less; Group 2 -- 9 to 11 bales; Group 3 -- 12 to 20 bales; and Group 4 -- 21 bales or more per hour rated ginning capacity. See weighting procedure for "All groups combined" in appendix.

2/ Taken from gin records and subjected to uniform allocation procedures as outlined in appendix.

3/ Sample gin costs excluding depreciation and interest.

4/ Sample gin costs from which effects of variations in rates used in computing depreciation and interest have been eliminated-- see appendix.

5/ Out-of-pocket costs plus standardized depreciation and standardized interest costs.

Table 3.--Sample gin costs per bale, by ranges and averages, groups 1 - 4 and all groups combined, 1/ West Texas, 1969-70 season

Cost items <u>2/</u>	Group 1		Group 2		Group 3		Group 4		All groups combined	
	Range	Average	Range	Average	Range	Average	Range	Average	Range	Average
<u>Dollars</u>										
Management.....	2.11-16.28	3.97	3.87- 8.35	4.85	1.88-10.24	3.01	1.31- 4.67	2.38	1.31-16.28	3.48
Insurance.....	.19- 2.41	.48	.28- .81	.36	.12- .75	.34	.22- .44	.32	.12- 2.41	.37
Taxes.....	.22- 1.52	.46	.22- 1.54	.54	.12- 1.48	.32	.12- 1.03	.44	.12- 1.54	.43
Energy.....	1.58- 2.50	2.00	.95- 6.07	1.94	1.68- 5.43	2.20	1.18- 3.06	2.06	.95- 6.07	2.07
Labor.....	4.21- 8.69	5.85	4.00- 8.11	5.43	3.72-10.56	5.10	3.86- 6.63	4.68	3.72-10.56	5.26
Bagging and ties.....	2.76- 3.48	3.08	2.73- 3.58	2.97	2.57- 3.97	3.04	2.64- 3.09	2.94	2.57- 3.97	3.01
Repairs.....	3.07- 8.51	4.66	1.53- 7.90	5.06	2.03- 7.15	3.97	3.39- 7.30	4.48	1.53- 8.51	4.48
Miscellaneous.....	1.29- 5.77	2.27	1.70- 7.01	4.08	1.42- 4.52	2.43	.86- 4.89	1.68	.86- 7.01	2.56
Out-of-pocket subtotal <u>3/</u> .....	17.08-38.34	22.77	17.83-38.95	25.23	16.06-35.72	20.41	16.30-27.59	18.98	16.06-38.95	21.66
Depreciation.....	1.63- 7.03	3.70	1.30- 7.33	3.28	2.25-17.90	4.96	1.50-11.79	5.11	1.30-17.90	4.34
Interest.....	0 - 5.77	1.40	0 - 9.78	.76	0 - 2.65	.93	0 - .87	.38	0 - 9.78	.89
Total.....	18.82-44.33	27.87	19.13-54.71	29.27	20.05-53.62	26.30	18.80-39.39	24.47	18.80-54.71	26.89
Standardized depreciation <u>4/</u> .....	3.59- 8.77	5.62	4.24-17.45	7.65	3.87-24.87	7.34	2.93-20.66	8.21	2.93-24.87	7.17
Standardized interest <u>4/</u> .....	1.42- 3.81	2.24	1.93- 6.98	3.11	1.63- 9.45	2.79	1.17- 7.78	3.09	1.17- 9.45	2.79
Total standardized <u>5/</u> .....	22.09-50.92	30.63	26.75-58.40	35.99	24.04-70.04	30.54	21.38-55.23	30.28	21.38-70.04	31.62

1/ Group 1 -- 8 bales or less; Group 2 -- 9 to 11 bales; Group 3 -- 12 to 20 bales; and Group 4 -- 21 bales or more per hour rated ginning capacity. See weighting procedure for "All groups combined" in appendix.

2/ Taken from gin records and subjected to uniform allocation procedures as outlined in appendix.

3/ Sample gin cost excluding depreciation and interest.

4/ Sample gin costs from which effects of variations in rates used in computing depreciation and interest have been eliminated--see appendix.

5/ Out-of-pocket costs plus standardized depreciation and standardized interest costs.

Table 4.--Estimated sample gin costs per bale at 70-percent capacity utilization, <sup>1/</sup> groups 1 - 4 and all groups combined, <sup>2/</sup> West Texas, 1968-69 and 1969-70 seasons

Cost items <sup>3/</sup>	1968-69				1969-70			
	Gin size group				Gin size group			
	1	2	3	4	All groups	1	2	3
Cost items <sup>3/</sup>								
Management.....	3.33	2.70	2.14	1.44	2.05	3.26	2.78	2.14
Insurance.....	.27	.21	.26	.18	.22	.38	.20	.22
Taxes.....	.31	.24	.24	.18	.22	.35	.25	.19
Energy.....	1.92	1.57	2.00	1.73	1.81	1.88	1.57	1.92
Labor.....	5.03	4.07	4.70	2.97	3.88	5.17	3.72	4.03
Bagging and ties.....	2.68	2.63	2.72	2.71	2.70	3.08	2.97	3.04
Repairs.....	3.78	3.91	3.36	3.73	3.65	4.59	4.94	3.84
Miscellaneous.....	1.74	2.50	2.13	2.03	2.09	2.24	3.96	2.36
Out-of-pocket subtotal <sup>4/</sup> .....	19.06	17.83	17.55	14.97	16.62	20.95	20.39	17.74
Depreciation.....	2.65	1.72	3.06	2.64	2.64	2.81	1.53	2.94
Interest.....	.86	.34	.52	.14	.37	1.06	.36	.55
Total.....	22.57	19.89	21.13	17.75	19.63	24.82	22.28	21.23
Standardized depreciation <sup>5/</sup> .....	4.09	3.58	4.33	4.00	4.05	4.26	3.58	4.35
Standardized interest <sup>5/</sup> .....	1.63	1.45	1.65	1.50	1.55	1.70	1.45	1.65
Total standardized <sup>6/</sup> .....	24.78	22.86	23.53	20.47	22.22	26.91	25.42	23.74

1/ See adjustment procedure in appendix.

2/ 1 - 4 --- Group 1 --- Group 2 --- 17 to 20 bales; and Group 4 --- 21 bales or more

Table 5.--Comparisons of individual cost items at varying and uniform rates of plant capacity utilization, 1/ for all four groups combined, 2/ five consecutive ginning seasons, sample gin plants, West Texas, 1965-66 through 1969-70

Cost items <u>3/</u>	Actual capacity utilization			Adjusted capacity utilization (70 percent)						
	1965-66	1966-67	1967-68	1968-69	1969-70	1965-66	1966-67	1967-68	1968-69	1969-70
<u>Dollars--</u>										
Management.....	1.98	3.10	3.24	2.92	3.48	1.82	1.84	1.71	2.05	2.37
Insurance.....	.27	.38	.38	.31	.37	.25	.25	.23	.22	.24
Taxes.....	.24	.41	.47	.38	.43	.22	.22	.22	.22	.25
Energy.....	1.67	1.97	2.24	2.08	2.07	1.65	1.67	1.84	1.81	1.77
Labor.....	3.64	3.83	4.47	5.03	5.26	3.51	2.82	3.48	3.88	4.01
Bagging and ties.....	3.02	2.93	2.79	2.70	3.01	3.02	2.93	2.79	2.70	3.01
Repairs.....	2.76	4.12	3.64	3.79	4.48	2.72	3.97	3.46	3.65	4.35
Miscellaneous.....	1.36	1.90	1.83	2.15	2.56	1.32	1.80	1.75	2.09	2.54
Out-of-pocket subtotal <u>4/</u> .....	14.94	18.64	19.06	19.36	21.66	14.51	15.50	15.48	16.62	18.54
Depreciation.....	3.41	5.73	6.00	4.40	4.34	3.12	3.07	2.85	2.64	2.49
Interest.....	.63	.92	.81	.61	.89	.57	.49	.38	.37	.51
Total.....	18.98	25.29	25.87	24.37	26.89	18.20	19.06	18.71	19.63	21.54
Standardized depreciation <u>5/</u> .....	4.69	8.11	8.72	6.77	7.17	4.30	4.35	4.15	4.05	4.12
Standardized interest <u>5/</u> .....	1.54	2.65	2.86	2.60	2.79	1.41	1.42	1.36	1.55	1.60
Total standardized <u>6/</u> .....	21.17	29.40	30.64	28.73	31.62	20.22	21.27	20.99	22.22	24.26
Percent capacity utilization.....	65	38	33	42	39	70	70	70	70	70

1/ Capacity utilization--ratio of volume ginned to seasonal ginning capacity without seed cotton storage. 2/ See weighting procedure for "All groups combined" in appendix. 3/ Taken from gin records and subjected to uniform allocation procedures as outlined in appendix. 4/ Sample gin cost excluding depreciation and interest. 5/ Sample gin costs from which effects of variations in rates used in computing depreciation and interest have been eliminated--see appendix. 6/ Out-of-pocket costs plus standardized depreciation and standardized interest costs.

costing methods shown since both the wide variations in depreciation and interest charges among sample gin plants and the fluctuations in annual volumes ginned have been eliminated.

The increase in total per bale operating costs, adjusted to 70-percent capacity utilization, has been almost continuous over the past 5 years. The one exception occurred in 1967-68 when there was a slight reduction in this cost figure from the previous season. This was the result of declines in per bale costs for management, depreciation, interest, insurance, bagging and ties, repairs, and miscellaneous items. Reductions in unit costs for management, repairs, and miscellaneous were only temporary, however, while those for interest, insurance, and bagging and ties continued into the 1968-69 season before again resuming an upward trend in 1969-70.

Per bale cost for depreciation, at 70-percent capacity utilization, has declined continuously since 1965-66. Apparently, gin machinery and equipment has been depreciated out at a faster rate than it was being replaced by new equipment. Pronounced increases in repair costs over the past 5 years tend to support this theory. Interest cost per bale, at 70-percent capacity utilization, also decreased continuously since 1965-66, until this year when it jumped back up to about the 1966-67 level. Reversal of this 4-year downward trend was due in part to greater amounts of operating funds being borrowed at higher rates of interest.

#### Sample Versus Model Gin Costs

Sample gin operating costs were compared with estimates of operating costs for synthesized gin plant models developed to incorporate attainable efficiencies in the use of machinery, equipment, labor, and energy (2). Model costs are directly comparable with standardized sample gin costs.

Estimates of total operating costs for the models 7/ were about 14 and 13 percent lower than the actual averages for groups 1 and 2, respectively, with which they were compared (table 6). 8/ Using per bale out-of-pocket costs in these comparisons, the differences favoring the models were much greater (about 29 and 31 percent higher, respectively).

A comparison of individual cost items showed that the greatest differences, in favor of the models, were in repairs; followed by miscellaneous, labor, management, and energy, in that approximate order. Higher per bale costs for depreciation, interest, and taxes in the models reflect current construction costs for new gins which are considerably greater than those paid for most of the sample gins when they were built originally.

7/ Comparative models rated at 8 and 10 bales per hour for groups 1 and 2, respectively.

8/ Costs for model gins were based on single plants. Several of the sample gins in groups 3 and 4 were multiplant operations and, hence, not directly comparable. Therefore, only the relationships of groups 1 and 2 to the models were examined.

Table 6.--Comparison of sample gin costs, 1/ for size groups 1 and 2 with models of comparable sizes, 2/ both adjusted to 70-percent capacity utilization, 3/ West Texas, 1969-70

Cost items	Group 1		Group 2	
	: Sample : gin : average	: Comparative : model : gin	: Sample : average	: Comparative : model : gin
	----- Dollars -----			
Management.....	3.26	2.30	2.78	2.11
Insurance.....	.38	.32	.20	.31
Taxes.....	.35	.69	.25	.65
Energy.....	1.88	1.41	1.57	1.32
Labor.....	5.17	3.35	3.72	3.04
Bagging and ties.....	3.08	3.08	2.97	2.97
Repairs.....	4.59	2.08	4.94	2.07
Miscellaneous.....	<u>2.24</u>	<u>1.70</u>	<u>3.96</u>	<u>1.70</u>
Out-of-pocket subtotal <u>4/</u> .....	20.95	14.93	20.39	14.17
Standardized depreciation <u>5/</u> .....	4.26	6.02	3.58	5.70
Standardized interest <u>5/</u> .....	<u>1.70</u>	<u>2.31</u>	<u>1.45</u>	<u>2.18</u>
Total standardized <u>6/</u> .....	26.91	23.26	25.42	22.05

1/ Taken from gin records and subjected to uniform allocation procedures as outlined in appendix.

2/ Group 1 -- 8 bales or less and Group 2 -- 9 to 11 bales, per hour rated ginning capacity. Comparative models rated at 8 and 10 bales per hour, respectively--see (2).

3/ Estimated total seasonal ginning capability without seed cotton storage times 70 percent.

4/ Cost excluding depreciation and interest.

5/ Costs from which effects of variations in rates used in computing depreciation and interest have been eliminated--see appendix.

6/ Out-of-pocket costs plus standardized depreciation and standardized interest costs.

## DISCUSSION

The gin operator has varying degrees of control over gin operating costs. The total cost of depreciation, interest, taxes, and insurance on buildings and equipment is determined before the first bale of the season is ginned. These costs are incurred regardless of the number of bales actually ginned or the hours of plant operation. Also, a supply of bagging and ties is usually contracted for, at a fixed rate per bale, prior to the beginning of the season. Emergency repairs must be made when necessary to keep the gin operating, although a good program of routine maintenance, servicing, and periodic overhauling can greatly reduce the incidence of such breakdowns and help to assure continuous, high-level plant performance. Prudent use of permanent gin personnel will minimize the cost of this program. Miscellaneous costs incorporate a host of items--each of which needs to be examined by gin managers to determine its necessity and effect on total operating costs and ginning volumes.

Energy is one cost area in which opportunities for reducing costs through improved operating efficiencies still exist. For example, when abnormally long intervals are anticipated between trailers at the suction pipe, materials handling and processing machinery should be shut down. Likewise, at the beginning of a new ginning season a second gin plant on the yard should not be started up until sufficient seed cotton has been assembled to ensure relatively continuous operation throughout the remainder of the season. This is particularly important in areas where subsequent billing is based on the preestablished peak in kilowatt demand. Frequently, if a motor fails during the season, a spare is substituted without regard for size other than its being "large enough" to keep the gin operating. This practice is all right as a temporary measure, but oversized electric motors can raise energy costs needlessly and should be replaced at the earliest opportunity (3). These and other efficiency measures in the use of electrical power in cotton gins can reduce per bale energy costs (4,5).

Perhaps the greatest potential for cost reduction in ginning is in the use of labor. Labor alone can account for 20 percent or more of the total ginning cost (1). Rates paid ginners and gin hands are determined either by law or by competition and are relatively inflexible. Therefore, a cost saving in labor would have to stem from a reduction in crew size, more efficient use of individual employees, or both. Crew size based on findings in the development of model gins (2), ranges from 6 to 14 men for the 6- to 24-bale model gins, respectively. In most cases, these specifications are exceeded in actual practice. Also, a full crew is frequently kept on duty when a partial crew would be adequate. When seed cotton receipts at the gin yard are slow and sporadic, particularly at the beginning and end of the season, only a skeleton crew should be maintained until sufficient volume accumulates to ensure continuous operation of the gin plant for at least one full shift.

Findings emphasize the need for a concerted effort by all gin owners to carefully analyze their operations for means of increasing and reducing costs.

## APPENDIX: METHODOLOGY

Gins vary widely by type of organization, ownership structure, accounting procedures, and in many other ways. In analyzing costs reported by sample gins, uniform allocation procedures were employed to compensate for some of these differences.

Costs of hauling cottonseed and lint--such as truck drivers' wages, truck depreciation, insurance, road-use taxes, and associated truck-operating costs--were excluded.

### Cost Allocations

Management: Where applicable, includes salaries, bonuses, commissions, expense allowance, house rent, and personal insurance policies for owners and managers; bookkeeping and other office salaries, home office cost (line companies); social security taxes, workmen's compensation insurance, and any other insurance on management and office personnel.

Depreciation: Includes allowances for depreciation exactly as carried on gin records except under standardized and out-of-pocket costs.

Interest: Includes interest exactly as carried on gin records except under standardized and out-of-pocket costs.

Insurance: Includes all forms of insurance on gin buildings, equipment, housing furnished management and labor, cotton products, and automotive equipment (except large trucks and trailers).

Taxes: Includes all taxes on real property only.

Energy: Includes all utilities--electricity, gas, and water--used in ginning and directly related operations.

Labor: Includes gin wages, social security, workmen's compensation, and any other insurance of gin labor borne by the gin; plus any rental housing furnished labor (excludes gin repair labor, see "Repairs" below).

Bagging and ties: Includes actual cost of bagging and ties purchased.

Repairs: Includes gin repair wages, social security, workmen's compensation, and other insurance on gin repair labor borne by the gin; plus the cost of repair materials and supplies.

Miscellaneous: Includes combined car and pickup, tractor, and other automotive expense; telephone and telegraph; advertising and promotion; legal and audit; dues (except \$1 per bale for Cotton Board assessment for research and promotion) memberships, and subscriptions; annual meetings, directors' fees and expense; conventions and travel expenses; donations and contributions; cotton losses from fire; sampling, compressing, and related charges; gin supplies; and any other costs not included elsewhere.

### Costing Methods

Sample gin costs: Gin costs which have been subjected to the above allocations are identified in this report as sample gin costs.

Standardized sample gin costs: Sample gin costs from which the effects of variations in rates used in computing depreciation and interest have been eliminated by adopting uniform rates. Depreciation was set at 10 percent of the initial purchase price of capital items carried on the depreciation schedule regardless of age or former method of depreciation. For 1968-69 and 1969-70, interest was charged at 7 percent on the estimated average gin site land values for the general area and 7 percent on one-half the cost of buildings, machinery, and equipment. For 1965-66, 1966-67, and 1967-68, a 6-percent interest rate was used.

Out-of-pocket costs: Sample gin costs from which depreciation and interest have been excluded.

### Cost Adjustments

Estimates of ginning costs at other than existing levels of capacity utilization were based on relationships assumed in the synthetic development of a series of model gins (2).

### Weighting

During the first 4 years of this study a simple weighted average of all gins in the sample was taken in developing the average cost for "all groups combined." In computing this average for the 1969-70 season, the average cost for each group was first weighted by its representative proportion of the total rated hourly ginning capacity in West Texas and then by its volume ginned. This change was initiated to reflect more accurately the cost of ginning an "average" bale of cotton in West Texas.

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